

**DEVICE FOR EXTRACTING AND TAKING SAMPLES  
FROM AN AQUEOUS SOLUTION IN A SUBSTRATE**

**BACKGROUND OF THE INVENTION**

This application claims priority of Spanish Application Serial No. 200001559, filed on June 9, 2000, the disclosure of which is expressly incorporated by reference herein.

5 Known procedures and devices carry out the collection of a soil sample which is taken to the laboratory dampened water. This has the inconvenience that the aqueous solution found in the edaphic profile or substratum is not used directly, and thus the degree of distortion of the analysis depends mainly on the qualitative composition of the water used.

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**SUMMARY OF THE INVENTION**

An object of the present invention is a device used to extract and take samples from an aqueous solution in a substrate.

15 The device of the present invention is applied to carry out the sampling of an aqueous solution in, for example, soils with different horizons of the edaphic profile or substratum, called the soil solution; land drainage; artificial inorganic substrata, saturated or unsaturated; and artificial organic substrata, saturated or unsaturated.

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The device is usable, in particular, for agricultural, environmental and industrial applications.

Among others, the following specific agricultural applications can be mentioned: studies of the composition of different chemical forms, evolution and degradation of organic

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compounds (chelates) and inorganic compounds in their different chemical forms. Also, to discover the evolution and availability of fertilizing nutrients in general, over the whole soil profile.

In the environmental area, the device is used to control polluting effluents such as nitrates, nitrites, fitosanitary compounds in general, chemical evolution of inorganic compounds, organic compounds (chelates, remains of pesticides), and the control of aquifers.

In the industrial area, the device is used to control ponds for decanting solids and/or liquids, and residue control.

The device is formed by a pyrometrical capsule of porous porcelain, permeable to the solution in the soil and intended not to modify the original characteristics of the solutions.

This capsule has a step shape on the end perimeter to which is attached a tube of total inert material such as P.V.C., polyethylene, etc. and of external diameter which is preferably the same as the external diameter of the capsule.

At the free end of the tube, a rubber pipe with hermetic closure is attached. On the cap of the closure is attached the end of: an adapter tube for a vacuum pump, and a suction gland that is introduced lengthways into the probe.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

Other objects, advantages and novel features of the present invention will become readily apparent from the following

detailed description of the invention when considered in conjunction with the accompanying drawings.

The sole figure is a sectional view of the device of the invention.

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#### **DETAILED DESCRIPTION OF THE DRAWINGS**

The device designated generally by numeral 1 is constituted by a probe 2 formed by a pyrometric capsule 3 of porous porcelain, having a decreased section 4 in the end area, to which is attached the end of a tube 5 of known inert material, such as P.V.C., polyethylene, etc.

A rubber cap 6 is attached on the free end of the tube 5 to obtain an hermetic seal.

Two holes 7,8 are drilled into cap 6 into one of which holes is attached the end of an adapter tube 9 to a vacuum pump (not shown) and in the other hole is attached a capillary suction tube 10 which is the one placed inside the probe.

The foregoing disclosure has been set forth merely to illustrate the invention and is not intended to be limiting. Since modifications of the disclosed embodiments incorporating the spirit and substance of the invention may occur to persons skilled in the art, the invention should be construed to include everything within the scope of the appended claims and equivalents thereof.